

Title (en)

Apparatus to solder a connector with a solar cell with a cleaning unit

Title (de)

Vorrichtung zum Löten eines Verbinders mit einer Solarzelle mit einer Reinigungseinrichtung

Title (fr)

Appareil de brasage d'un connecteur et d'une cellule solaire avec une unité de nettoyage

Publication

**EP 2269757 A1 20110105 (DE)**

Application

**EP 09008536 A 20090630**

Priority

EP 09008536 A 20090630

Abstract (en)

The device for soldering a connector made of tinned solder strip with a solar cell to produce solar cell strings, comprises a transport belt driven in time by a drive for moving the connector and solar cell in an arrangement fixed in position to each other to a soldering station, in which a mechanical compressive force is exercised onto the connector and the solar cell during the soldering. The soldering station comprises a base frame (1) for receiving a soldering unit (18) processable on a carriage (11) at the base frame horizontally transverse to a running direction of the transport belt. The device for soldering a connector made of tinned solder strip with a solar cell to produce solar cell strings, comprises a transport belt driven in time by a drive for moving the connector and solar cell in an arrangement fixed in position to each other to a soldering station, in which a mechanical compressive force is exercised onto the connector and the solar cell during the soldering. The soldering station comprises a base frame (1) for receiving a soldering unit (18) processable on a carriage (11) at the base frame horizontally transverse to a running direction of the transport belt with a solder head housing and a feed unit (19) for a separate vertical lowering of the solder head housing in a working position that lies below its horizontal process position at the arrangement of the connector and solar cell to the transport belt or a vertical lifting from the working position into the process position, soldering tips held from the solder head housing and bearing the soldering pins for introducing a defined compressive force during placing the soldering pins on the connector and the solar cell, a blank holder associated to the soldering pins, horizontally processable and lowerable or liftable vertically into the or from the working position with blank holder strips by the feed unit for holding down the connector to the solar cell during soldering in the working position or for releasing the solar cell after the soldering and cooling for its intermittent further transport with the transport belt, and a cleaning device assigned to the soldering unit transverse to the running direction of the transport belt for periodic cleaning of the soldering pins provided with soldering tips. An electrical or pneumatic drive such as electric motor is provided for horizontal process of the carriage. The solder head housing has a vertically arranged guiding bush, in which the solder pin is linearly guided. Each soldering pin is provided with a vertical balance system, which brings the compressive force by a defined spring force during soldering the connector and the solar cell. A pressure spring used in the guiding bush is provided as balance system for the soldering pin. Two vertically stacked leaf-springs that are arranged on top of each other and hold the soldering pin are provided as balance system, and are fixed at the solder head housing. The feed unit has a pneumatic cylinder for producing a rapid lowering movement of the solder head housing. The pneumatic cylinder is pivotably arranged in a sloping position inside the feed unit around its ends turned away from a cylinder rod, which is connected with an arm of a joint lever to slow down at the end of the feed movement, where a further arm of the joint lever is pivotably hinged at a support for the solder head housing and the joint lever is rotatable at an axis symmetrically arranged to the arms. The support is vertically displaceable in guides arranged parallel to each other for the solder head housing. A rapid closure is provided for mechanically connecting the feed unit and the solder head housing. The feed units are provided for producing the feed movement with an electric drive. The number of the solder heads individually situated in the soldering unit corresponds to the number of the connector to be soldered to the solar cell. A heating cartridge provided with a temperature sensor is arranged in the solder pin. The soldering tip is formed as exchangeable wear part. The blank holder has a separate vertically processable feed unit for lowering and lifting the blank holder strips, which are fixed at the carriage. The blank holder is horizontally processable with the carriage at maximum cell timing. The blank holder strips connected with the feed unit are retractably arranged transverse to the longitudinal direction of the transport belt between the soldering tips. The solder head housing is bringable from the working position into the horizontal process position using the feed unit and a further feed unit with which the carriage is processable in the process position over the cleaning device and the soldering pins and the soldering tips are bringable into the cleaning position by the feed unit. The cleaning device has two counter-rotating rollers provided with a sponge coating suited for receiving cleaning liquid, where the rollers are connected to the drive with the electric motor. The cleaning device is vertically liftable formed by the feed unit.

Abstract (de)

Die Erfindung betrifft eine Vorrichtung zum Verbinden, insbesondere Löten, eines Verbinders (10) aus verzinnm Lötband mit einer Solarzelle (9) zur Herstellung von Solarzellenstrings. Die Vorrichtung eine Lötstation aufweist, wobei diese Lötstation umfasst a ein Grundgestell (1) zur Aufnahme mindestens einer auf einen Schlitten (11) am Grundgestell (1) horizontal verfahrbaren Lötseinheit (18) mit mindestens einem Lötkopfgehäuse (23) und mindestens einer Zustelleinheit (26) für ein separates vertikales Absenken des Lötkopfgehäuses (23) in eine unterhalb ihrer horizontalen Verfahrlage (LI) gelegenen Arbeitsposition, b mindestens eine, insbesondere mehrere vom Lötkopfgehäuse (23) gehaltene, Lötspitzen tragende Lötstifte (24) zum Aufbringen einer definierten Druckkraft auf den Verbinder und Solarzelle (9), c ein den Lötstiften (24) zugeordneter, horizontal verfahrbarer und vertikal in die bzw. von der Arbeitsposition zustell- oder anhebbarer Niederhalter (21) mit Niederhalteleisten (53) zum Niederhalten der Verbinder (10). d eine jeder Lötseinheit (19) zugeordnete, am Grundgestell (1) quer zur Laufrichtung des Transportbandes (8) befestigte Reinigungseinrichtung (27) zum periodischen Reinigen der Lötstifte (25) mit Lötspitzen (24).

IPC 8 full level

**B23K 1/00** (2006.01); **B23K 1/005** (2006.01); **B23K 3/06** (2006.01); **B23K 3/08** (2006.01); **H01L 31/05** (2006.01); **H01L 31/18** (2006.01)

CPC (source: EP)

**B23K 1/0016** (2013.01); **B23K 1/005** (2013.01); **B23K 3/0615** (2013.01); **B23K 3/08** (2013.01); **H01L 31/05** (2013.01); **H01L 31/188** (2013.01); **B23K 2101/38** (2018.07); **Y02E 10/50** (2013.01)

Citation (applicant)

- DE 10335438 B4 20061228 - ATN AUTOMATISIERUNGSTECHNIK NI [DE]
- DE 102006022818 A1 20071122 - SOLARWATT AG [DE]

Citation (search report)

- [YA] EP 1291929 A1 20030312 - STRELA GMBH [CH]
- [Y] US 2001045444 A1 20011129 - MURAMATSU MASAYOSHI [JP], et al
- [A] JP H10308579 A 19981117 - NEC CORP
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Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

Designated extension state (EPC)

AL BA RS

DOCDB simple family (publication)

**EP 2269757 A1 20110105; EP 2269757 B1 20130116;** PL 2269757 T3 20130830

DOCDB simple family (application)

**EP 09008536 A 20090630;** PL 09008536 T 20090630